IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Confirmation No.: 4589
FRANCIS HUMBLOT, *et al.*	Art Unit: 1797
Serial No.: 10/088,738	Examiner: Prem C. SINGH
Filed: 23 July 2002	Atty. Dckt: 033808 R 172
For: REDUCTION OF THE COKING IN CRACKING REACTORS	

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Mail Stop AF

Dear Sir:

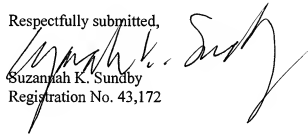
Applicants respectfully requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This Request is being filed with a Notice of Appeal.

The review is requested for the reasons stated on the attached sheets.

I am the attorney of record.

Respectfully submitted,



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REASONS FOR REVIEW REQUEST

The Claimed Invention

The present invention, as claimed, is directed to a process for reducing the coking on the metal walls of a heat exchanger which requires that the metal walls are pretreated with a mixture of a silicon compound and a sulfur compound (a Si + S mixture) in steam instead of pretreatment with one compound containing Si and S (a Si/S compound) in hydrogen/methane gas.

The Issues

1. Whether the Examiner improperly disregarded rebuttal evidence that the prior art taught away from the claimed invention on the basis that the teaching away reference was not cited by the Examiner in support of the rejection.

2. Whether an obviousness rejection is improper when based on the rationale of simple substitution where the Examiner failed to support the finding that the results of the substitution would have been predictable.

3. Whether an obviousness rejection is improper when Applicants show unexpected results and the Examiner fails to establish a finding of a reasonable expectation of success in obtaining the claimed unexpected results.

The Law

1. Office personnel should consider all rebuttal arguments and evidence presented by applicants. See MPEP 2145, In re *Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995); *In re Alton*, 76 F.3d 1168, 37 USPQ2d 1578 (Fed. Cir. 1996).

2. In order to reject a claim based on rationale (B) based on simple substitution to obtain predictable results, the Examiner must find that the results of the substitution would have been predictable. If this finding can not be made then the simple substitution rationale (B) can not be used to support a conclusion of obviousness. See MPEP 2143.

3. Where an Examiner uses the Teaching, Suggestion or Motivation (TSM) rationale (G) to support a conclusion of obviousness, the Examiner must articulate a finding that there was a reasonable expectation of success. If this finding can not be made then the TSM rationale (G) can not be used to support a conclusion of obviousness. See MPEP 2143; *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, 82 USPQ2d 1385 (2007), and *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360, 80 USPQ2d 1641, 1645 (Fed. Cir. 2006).

The Facts

1. EXAMINER'S IMPROPER DISREGARD OF REBUTTAL EVIDENCE

On page 10 of the Final Office Action mailed 12 November 2008, in response to the Applicants' assertion that WO95/22588 and associated U.S. Patent No. 5,922,192 teaches away from the claimed invention, **the Examiner stated that: "The Applicant's argument is moot because the above cited reference is not part of the rejection"**.

Since Office personnel should consider all rebuttal arguments and evidence presented by applicants, it was improper for the Examiner to disregard Applicants' rebuttal evidence, i.e. WO95/22588 and U.S. Patent No. 5,922,192, and arguments of teaching away. See MPEP 2145, In re *Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995); *In re Alton*, 76 F.3d 1168, 37 USPQ2d 1578 (Fed. Cir. 1996).

2. THE EXAMINER FAILED TO SUPPORT THE FINDING THAT THE RESULTS OF THE SUBSTITUTION WOULD HAVE BEEN PREDICTABLE

The Examiner failed to support the finding that the results of substitution would have been predictable because (1) treating a feedstock is not the same as pretreating a metal, (2) steam is not functionally equivalent to hydrogen/methane gas in pretreating a metal, (3) a Si + S mixture is not functionally equivalent to a Si/S compound in the context of pretreating a metal, and (4) none of the experiments in the cited documents allow one to predict that pretreatment of a metal with a Si + S mixture in steam instead of a Si/S compound in hydrogen/methane gas will inhibit coke formation.

(1) treating a feedstock is not the same as pretreating a metal

Zimmermann shows that pretreating the metal with a Si/S compound inhibits coke formation up to 35 hours. After 35 hours, coke formation increases unless an additive is added to the feedstock. Zimmermann shows that adding a Si + S mixture to the feedstock decreases the effectiveness of pretreating the metal with a Si/S compound, but aids in inhibiting coke formation after 35 hours. In every example provided by Zimmermann where a Si + S mixture was added to the feedstock, the metal was first pretreated with a Si/S compound. Nowhere do the cited documents teach or suggest that treating a feedstock is the same as pretreating a metal such that the methods and materials used in one are applicable to the other. Since treating a feedstock is not the same as pretreating a metal, the methods and materials of one can not be used to predict the results of a substitution in the other.

(2) steam is not a simple substitute for hydrogen/methane gas

Because a Si/S compound in hydrogen/methane gas works, but a Si/S compound in steam "is not suitable" for inhibiting coke formation, steam is not functionally equivalent to hydrogen/methane gas. Thus, steam is not a simple substitute for hydrogen/methane gas in the pretreatment process. Since steam is not functionally equivalent to hydrogen/methane gas, the substitution of one for the other would not yield predictable results.

(3) a Si + S mixture is not a simple substitute for a Si/S compound

Nowhere do the cited documents teach or suggest that a Si + S mixture is functionally equivalent to a Si/S compound for the pretreatment of metal in order to inhibit coke formation. If a Si + S mixture were considered to be functionally equivalent and thus a simple substitute of a Si/S compound, the predicted result of using a Si + S mixture in steam by one of ordinary skill in the art would have been that the Si + S mixture in steam would not be suitable for pretreatment in order to inhibiting coke formation.

However, as provided in the instant specification, pretreatment of the metal with a Si + S mixture in steam unexpectedly works well. Thus, one of ordinary skill in the art would not have been motivated to pretreat the metal with a Si + S mixture instead of a Si/S compound with a reasonable likelihood of success in inhibiting coke formation.

Nevertheless, it was unexpected that pretreatment with a Si + S mixture in steam worked to inhibit coke formation.

(4) none the Si + S mixture experiments in Zimmermann are conducted without pretreatment with a Si/S compound

Since none of the Si + S mixture experiments in Zimmermann are conducted without pretreatment of a Si/S compound, one skilled in the art can not predict what would be the likely the effect of pretreatment with a Si + S mixture.

Therefore, since (1) treating a feedstock is not the same as pretreating a metal, (2) steam is not a simple substitute for hydrogen/methane gas, (3) a Si + S mixture is not a simple substitute for a Si/S compound, and (4) none of the experiments in the cited documents allow one to predict that pretreatment of a metal with a Si + S mixture in steam instead of a Si/S compound in hydrogen/methane gas will inhibit coke formation, the Examiner has failed to establish that substituting a Si/S compound with a Si + S mixture and substituting hydrogen/methane gas with steam would yield predictable results. As such, the Examiner can not reject the claimed invention based on rationale (B) and the rejection under 35 U.S.C. 103(a) must be withdrawn. See MPEP 2143.

3. THE EXAMINER FAILED TO ESTABLISH A FINDING OF A REASONABLE EXPECTATION OF SUCCESS

Applicants respectfully submit that one of ordinary skill in the art would not have been motivated to substitute hydrogen/methane gas with steam for pretreating a metal since WO95/22588 (WO '588, U.S. Patent No. 5,922,192 (US '192)) teaches against using steam as steam is ineffective inhibiting coke formation.

Despite the fact that a Si + S mixture is not functionally equivalent a Si/S compound and the prior art teaching away from the suitability of steam for pretreating metal in order to reduce coke formation, Applicants unexpectedly discovered that the use of steam, when used with a Si + S mixture instead of a Si/S compound, in the pretreatment of metal effectively inhibits coke formation. In fact, Applicants surprisingly found that a pretreatment with a Si + S mixture in steam significantly reduces the formation of coke on metal walls of reactors (e.g. inhibition rate

ranges between 66% and 36% through 6 cracking/decoking cycles). See pg. 5 of the instant specification and Table 2.

Nowhere has the Examiner established that one of ordinary skill in the art would have been motivated to pretreat metal with a Si + S mixture in steam despite the teaching away that a Si/S compound in steam does not work, with a reasonable likelihood of success that it would significantly inhibit coke formation. As such, the Examiner can not reject the claimed invention based on rationale (G) and the rejection under 35 U.S.C. 103(a) must be withdrawn. See MPEP 2143.

As the Examiner has clearly failed to establish a prima facie case of obviousness, Applicants respectfully request that the Review Panel find that the pending claims are allowable over the art and issue a Notice of Allowance. Alternatively, Applicants request that the Review Panel reopen prosecution and require that Applicants' rebuttal evidence and arguments related to WO95/22588 and associated U.S. Patent No. 5,922,192 be properly considered.